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the enrichment of an enzyme produced by the microorganism that is involved in the metabolism of the first substrate.

Where the microorganism produces an enzyme, or enzymes, that are involved in the metabolism of the test substrate, the method enables the selective enrichment of a microorganism that produces such enzyme or enzymes.

The present inventors have found that the above method for "on-line" determination of a change in the level of a metabolism indicator, such as O_2 , as an indicator of cellular activity enables indirect measurement of biomass or substrate utilisation and have identified that this can be used to evaluate the status of a population of microorganisms in real-time. The inventors have further tailored this technique for enriching microorganisms that are capable of metabolising a test substrate, such as a hydrocarbon compound for which a microorganism is desired to be found to convert the compound (test substrate) into a different hydrocarbon(s) and/or break the compound down with water as a byproduct. Such metabolism may be accompanied by the production, or up-regulation of an enzyme or enzymes that are involved in the metabolism of the test substrate. Thus, the metabolism of the microorganism also reflects an increase in the population or amount of enzyme in the vessel (compared to the relative amount of that enzyme in the vessel at the outset of the procedure) that has the desired function of catalysing the reaction of the test substrate.

The technique developed by the inventors has further advantages in terms of its flexibility in discovering microorganisms capable of metabolising a test substrate in conditions selected by the operator (i.e. a selective pressure), and potentially modified by the operator over time. The modification of conditions can be used to identify microorganisms that have the capability of producing an enzyme or enzymes that assist in the metabolism of the test substrate under such conditions.